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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,276	10/25/2000	Masashi Shiraishi	142361-001040	4370

7590

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/696,276

Applicant(s)

SHIRAISHI ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 6-20 and 34-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 21-25 and 27-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: .

### **DETAILED ACTION**

1. Applicant's election of group I, claims 1-15 and 21-39, a flex printed circuit board, in Paper No. 8 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Further, acknowledged is the election of specie I, reading on figure 6, claims 1-5, 21-24, 26 and 27-33, paper No. 11. As mutually exclusive embodiments comprising species add additional burden, the specie requirement is made final.

Claims 6-15, 16-20, 25, and 34-39 are withdrawn from further consideration.

### ***Drawings***

2. The drawings are objected to because the figures are improperly cross hatched. The cross hatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Figures 5a, 5b and 5c should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-5, 21-24, 26 and 27-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is not clear what is meant by the "conductive structure" and "anisotropic conductive adhesive disposed surrounding the conductive structure". Whether, the anisotropic adhesive is part of the conductive structure or they are different. If they are different, the same are not shown in figure 6, the figure representing the elected specie. Similarly,

regarding claim 21 and 27, if anisotropic conductive adhesive and a conductive bump/conductive element are different, they are not shown in figure 6.

Regarding the dependent claims, the relation between the conductive structure and the adhesive film is not clear.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 21, 23, 24, 26-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., US Patent No. 6,098,271, hereafter, Yamamoto, in view of Scheidecker et al., US Patent No. 5,734,523, hereafter, Scheidecker. This rejection is made to the extent that the claims are understood.

Regarding claim 1, 21 and 27, Yamamoto discloses a flex circuit attached to at least one bonding pad comprising: a base film; a conductive layer situated below the base film; an overcoat layer comprising at least two sections situated below the conductive layer, a bottom surface of each section overlapping partially a top surface of the bonding pad (FPC 26 with polyimide films 44, 46 and conductive layer 38, see figure 4, column 5, line 25-40); except, a conductive structure forming an electric conduit between the conductive layer and the at least one bonding pad with anisotropic conductive adhesive disposed at least surrounding the conductive structure for bonding the FPC to the at least one bonding pad. Yamamoto discloses a solder connection with copper or nickel-gold bump, however, use of anisotropic adhesive with metal particles or balls for electrical and mechanical connection is known in the art and can be used to avoid high temperature involved with the soldering and to avoid cracking as metal

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bumps with solder are subject to cracking due to thermal stresses. Further resilient material such as conductive elastomers are able to absorb stresses better than conventional solder bump. Scheidecker discloses one such method using conductive adhesive with conductive particle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Yamamoto with conductive adhesive instead of solder connection as taught by Scheidecker, in order to have electrical and mechanical connection at low temperature and avoiding cracking of the metal bump connection.

Regarding claim 3, 26, 29, 31 Yamamoto further discloses the anisotropic conductive film (Scheidecker – Z axis adhesive layer 66, see figure 8 and 9).

Regarding claim 23, Yamamoto further discloses the overcoat layer positioned below the conductive layer (polyimide layer 46, see figure 4, column 5, line 25-40).

Regarding claim 24, 28 Yamamoto further discloses the overcoat layer overlapping an end of a top surface of the bonding pad (polyimide layer 46, see figure 4, column 5, line 25-40).

8. Claims 2, 4-5, 22, 30, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yamamoto et al., US Patent No. 6,098,271, hereafter, Yamamoto and Scheidecker et al., US Patent No. 5,734,523, hereafter,

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Scheidecker as applied to claim 1 above, and further in view of Tsukagoshi et al., US Patent No. 4,740,657, hereafter Tsukagoshi. This rejection is made to the extent that the claims are understood.

Regarding claim 2, 22,30 though the modified assembly of Yamamoto does not explicitly disclose the kind of conductive particle used, any metal particle with good conductivity can be sued. Tsukagoshi discloses use of gold as metal particle, column 6, line 5-20. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the modified assembly of Yamamoto with gold as metal particles in the conductive adhesive as taught by Tsukagoshi in order to have better electrical connection.

Regarding claim 4 and 32, Tsukagoshi further discloses the conductive element having average particle size 0.5 to 300  $\mu\text{m}$ , column 7, line 10-30, which covers the range 12 to 38  $\mu\text{m}$ .

Regarding claim 5 and 33, Tsukagoshi further discloses the gold ball, see figure 1 and 2.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al., Farnworth, Kulesza et al., Mase, Shiraishi et al., Park

et al., Nelson et al., Yamada et al., and Chen et al., disclose assembly similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp  
November 12, 2002

  
**ALBERT W. PALADINI**  
**PRIMARY EXAMINER**